**COURSE SYLLABUS FORM**

**American University of Beirut**

**Faculty of Arts and Sciences**

**Department of Physics**

**Course Number and Title: Physics 211L**

**ELECTRICITY AND MAGNETISM LABORATORY**

**Spring 2016**

**1. Course Description and Learning Outcomes**

Physics 211L is one-credit laboratory course designed primarily for electrical, computer and communications engineering students and has Physics 211 (Electricity and magnetism) as a pre- or co-requisite. This course is also among the pre-medical course requirements for chemistry students. Some of the laboratory skills that students will acquire during this course are: collection and analysis of experimental data, error analysis, graphical representation and computer assited data acquisition and analysis*.*

**2. Resources Available to Students**

*Laboratory manual and reports:*

 The Physics 211L laboratory manual as well as the lab report should be downloaded on a weekly basis from MOODLE.

*Textbook (Physics 211):*

*Fundamentals of Physics*, By Halliday and Resnick, (9th Ed.), Wiley 2007

**3. Grading Criteria**

There will be a **60-minutes written final exam** at the end of the course. The final grade will be computed as follows:

* Laboratory reports (computed with the best 9 report grades) **40%**
* Evaluation by the instructor \* **10%**
* Final exam **50%.**

*\*As part of this evaluation, your instructor will give* ***a minimum of two drop-reading-quizzes*** *during the semester. These quizzes will be given at the beginning of the lab session, in order to check your reading and understanding of the lab manual. Note that theory for all experiments may be found in the Phys 211 textbook.*

**4. Schedule**

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| **Week** | **Experiment** |
| 1st week: Feb. 2-4 | Introduction and Analysis of Experimental Results (Room 202) |
| 2nd week: Feb. 10-11 | Ohm’s Law (Room 202) |
| 3rd week: Feb. 16-18 | Basic Oscilloscope (Room 211) |
| 4th week: Feb. 23-25 | Electric Circuits (Room 202) |
| 5th week: Mar. 1-3 | Capacitance and dielectrics (Room 211) |
| 6th week: Mar. 8-10 | RL and RC series circuits (Room 202) |
| 7th week: Mar. 15-17 | Measurement of the e/m Ratio of electrons (Room 211) |
| 8th week: Mar. 22-24 | Measurement of magnetic induction fields (Room 202) |
| ***Saturday May 28th***  | ***Makeup for Tuesday Mar. 25th, Measurement of Magnetic Induction Fields (Room 202)*[ONLY for sections 3 and 4]** |
| 9th week: Mar. 29-31 | Transformers (Room 211) |
| 10th week: April 5-7 | RLC series circuit (Room 202) |
| 11th week: April 12-14 | Measurement of the force between two parallel current-carrying conductors ( Room 211) |
| 12th week: April 19-21 | REVIEW SESSION ( Room 211) |
| **Final Exam: Thursday April 28, Nicely 500, at 6:00 P.M** |

**5. Course Procedure and Policies**

***Attendance:*** Attendance of all the experiment sessions is mandatory. You will be given a grade of zero for a missed experiment and you will be responsible, in the final exam, for the material covered in that experiment. You will perform ten experiments during the semester. Your final lab-report grade will be computed as the average of the best nine report-grades. There are no make-ups for missed experiments. You will be given a grade of zero for a missed experiment and you will be responsible, in the final exam, for the material covered in that experiment. **Any student missing *more* *than two experiments* should drop the course; otherwise he/she will be given a failing grade. Please note that it is the responsibility of the student to drop the course.**

***Lab sessions:*** The lab sessions start at 1:00 P.M and 3:00 P.M. Late students will be penalized by deducting 10% from the grade of the report of that session. No student will be allowed to perform the experiment if he/she comes *10 min late*. In that case, the student will be considered as absent. **Any student who comes late for more than two experiments won’t be allowed to attend the session and he/she will be considered absent.** The assigned experiment should be thoroughly studied before you come to the laboratory session. ***On Moodle, there will be a power point presentation for every experiment along with narration which will explain the experiment in details. You should go through the power point presentation before coming to the lab.*** During the lab session there will be no explanation of the experiment, students will directly start performing the experiment. In each experiment, students will work in pairs, as each student will be assigned to one of eight groups. Students will be assigned different partners every week. The full duration of a lab session is 2 hours, during which students will perform the experiment and usually write a lab report. In some experiments, students will be asked to complete the lab report at home, in which case the report MUST be typed(you can use the Forms available on MOODLE in WORD format). You must use EXCEL (or some other software) for data analysis and graph plotting.

***Handling of equipment*:** Extreme care must be taken when doing the experiments in order to avoid the misuse or the damage of the laboratory equipment, some of which can be very expensive. Any deliberate misuse and damage of a piece of equipment will be reported to the course coordinator for action to be taken. Any problem with the equipment that arises during the course of an experiment should be immediately reported to the lab instructor for fixing. If the problem can’t be solved *promptly*, the instructor will move you to the “extra” set-up that has been installed for such emergencies. **Before leaving the lab, make sure that the apparatus is in good working condition and the table is neat and clean.** The students should use the equipment very carefully and strictly as directed in the laboratory manual to avoid any possible injury. Any peculiar behavior of an instrument should be reported to the lab instructor for inspection.

***Laboratory discipline*:** No eating, drinking, smoking or use of mobile phones is permitted in the laboratory. The instructor reserves the right to dismiss from class, any student acting in a manner that is considered disruptive or counterproductive to the teaching/learning process in the laboratory. **Turn off you cell phones in the lab**.

## Laboratory reports: Laboratory reports: You should download the laboratory “Report Form” of the experiment to be performed from MOODLE and bring it with you to the lab. If you do not have your Manual and Form, you will be penalized 10% for that report. Each group must submit ONE lab report at the end of the lab session. The laboratory report usually includes the “raw” data that you have collected during the experiments, the corresponding data analysis and end results, graphs, and discussion and answers to the questions found in the Form. Data and results should be reported according to the guidelines presented in the introductory session, which are also found in the “Analysis of Experimental Data” of the laboratory manual.

## You will be able to examine the corrected laboratory report a week after submitting it, during the following laboratory session or the office hours of your instructor. You may not take back your reports – these reports belong to the Department.

***Missing the Final Exam*:** A make-up for a missed final exam will be given, only after the Administrative Committee of the Faculty of Arts and Sciences approves the request for such a make-up. Medical reports will be considered only if, they are issued by the University Health Services of AUB or the AUB Medical Center. Additional information about make up examinations can be found on pages 133 and 134 of the 2006-07 AUB catalogue.

***Cheating*:** Any use of previous laboratory data or reports will be considered as an act of cheating and will be promptly dealt with **by giving the student a zero on the** **corresponding experiment**. Any student caught cheating or attempting to cheat during the final exam will be dismissed on the spot and will receive a failing grade in the course. In any of these cases, the infringement will be immediately reported to the Student Affairs Committee for further disciplinary action, which may include expulsion from the University.

***Office Hours*:** The laboratory instructors will hold regular weekly office hours that will be announced at the beginning of the semester. The students are urged to make use of the availability of the teaching staff, during these office hours for any questions or comments they have about the course and the material covered. If you cannot attend any of the posted office hours, call or e-mail the person you would like to see.

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| **Sections** | **Instructor** | **Office Hours** | **e-mail** |
| 1, 3  | Melissa Merhej  |  | mem15@mail.aub.edu |
| 2 | Jad Tannous |  | jat09@mail.aub.edu |
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